

Amendments to the Claims

The following listing of the claims replaces all previous listings and versions of the claims in the application:

5 Listing of the Claims:

1. (Currently Amended) A shell and tube reactor module for hydrogen production, comprising:

a reactor having a shell side, at least one palladium membrane tube as a tubular section, and a steam reforming catalyst section in said shell side; and

10 a catalytic combustion section having ~~a noble metal~~ an oxidation catalyst dispersed on a supporting material and surrounding the steam reforming catalyst section,

wherein said at least one palladium membrane tube has one sealed end located at upstream of flowing path, and said oxidation catalyst is formed by a noble metal with boron nitride.

15 2. (Previously Presented) The shell and tube reactor module according to claim 1, wherein said palladium membrane tube is formed by mounting a palladium membrane on a porous support, wherein said palladium membrane is made of [[one]] a material selected from [[a]] the group consisting of palladium, a palladium-silver alloy and a palladium-copper alloy.

20 3. (Original) The shell and tube reactor module according to claim 2 wherein said porous support is made of stainless steel.

4. (Original) The shell and tube reactor module according to claim 1, wherein a length of said at least one tube is between 3 cm and 120 cm.

5. - 6. (Canceled)

25 7. (Currently Amended) The shell and tube reactor module according to claim 1, wherein said steam reforming catalyst section comprises a catalyst selected from a group consisting of is one of CuOZnOAl₂O₃, PdOCuOZnOAl₂O₃ and K₂O,NiO/γ-Al₂O₃.

8. (Canceled)

9. (Previously Presented) The shell and tube reactor module according to Claim 1, wherein said catalytic combustion section is made of a stainless steel.

10. (Previously Presented) The shell and tube reactor module according to Claim 1, wherein said noble metal is selected from a group consisting of platinum (Pt), palladium (Pd), rhodium (Rh), Ruthenium (Ru) and a mixture thereof.

11. (Previously Presented) The shell and tube reactor module according to Claim 1, wherein said supporting material is one selected from a group consisting of γ -alumina, titania, zirconia, silica, and the alumina deposited with platinum.

12. (Original) The shell and tube reactor module according to claim 1, further comprising a reservoir containing fuels without H₂O provided for starting up heating.

13. (Currently Amended) An assembly of shell and tube reactor modules for hydrogen production, comprising a reactor splitting into two reactor sections and having a common shell, wherein each of said reactor sections has at least one palladium membrane tube as a tubular section and a steam reforming catalyst section; and
15 a catalytic combustion section having ~~a noble metal~~ an oxidation catalyst dispersed on a supporting material and surrounding the steam reforming catalyst section,

wherein said at least one palladium membrane tube has one sealed end located at upstream of flowing path, and said oxidation catalyst is formed by a noble metal with boron nitride.

14. (Original) The assembly of shell and tube reactor modules according to claim 13, wherein said palladium membrane tube is formed by mounting a palladium membrane on a porous support.

15. (Original) The assembly of shell and tube reactor modules according to claim 14, wherein said porous support is made of stainless steel.

16. (Original) The assembly of shell and tube reactor modules according to claim 13, wherein a length of said at least one tube is between 3 cm and 60 cm.

17. - 18. (Canceled)

19. (Currently Amended) The assembly of shell and tube reactor modules according to claim 13, wherein said steam reforming catalyst section comprises a catalyst selected from a group consisting of ~~is one of~~ CuOZnOAl₂O₃, PdOCuOZnOAl₂O₃ and K₂O,NiO/ γ -Al₂O₃.

5 20. (Canceled)

21. (Previously Presented) The assembly of shell and tube reactor modules according to claim 13, wherein said catalytic combustion section is formed of stainless steel.

22. (Previously Presented) The assembly of shell and tube reactor modules according to claim 13, wherein said noble metal is selected from a group consisting of platinum
10 (Pt), palladium (Pd), rhodium (Rh), Ruthenium (Ru) and a mixture thereof.

23. (Previously Presented) The assembly of shell and tube reactor modules according to claim 13, wherein said supporting material is one selected from a group consisting of γ -alumina, titania, zirconia, silica, and the alumina deposited with platinum.

24. - 34: (Canceled)